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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,455	02/24/2004	Roger A. Grey	01-2619A	8580
24114	7590	08/23/2005	EXAMINER	
LYONDELL CHEMICAL COMPANY 3801 WEST CHESTER PIKE NEWTOWN SQUARE, PA 19073			STRICKLAND, JONAS N	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/785,455

Applicant(s)

GREY ET AL.

Examiner

Jonas N. Strickland

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grey (US Patent 6,441,204 B1) in view of Schindler et al. (US Patent 6,916,756 B2).

Applicant claims a method of regenerating a used noble metal-containing titanium zeolite catalyst comprising the steps of heating the used catalyst at a temperature of at least 250°C in the presence of a gas stream comprised of oxygen to obtain a heated product; and reducing the heated product at a temperature of at least 20°C in the presence of a gas stream comprised of hydrogen to form a reactivated catalyst; wherein the noble metal-containing titanium zeolite catalyst was used to catalyze the epoxidation of an olefin with hydrogen and oxygen in the presence of at least one reaction solvent and at least one buffer.

Grey discloses a liquid-phase process for epoxidizing an olefin with hydrogen and oxygen in the presence of a catalyst mixture comprising a titanium zeolite and a supported catalyst comprising palladium. The process is highly selective and productive for transforming olefins to epoxides in the liquid-phase reaction of an olefin, hydrogen, and oxygen (see abstract). Grey continues to disclose wherein the catalyst may be thermally treated with hydrogen, as well as oxygen at a temperature from about 50-550°C (col. 3, lines 38-41). Grey also teaches a reaction solvent and a buffer. The solvents include water and aliphatic alcohols, and buffers, such as phosphate and borate (col. 3, line 59 – col. 4, line 22).

Schindler et al. teaches a catalyst comprised of mixtures of titanium oxides, as well as silicon oxides along with a noble metal, such as palladium (col. 4, lines 1-24). Schindler et al. continues to teach wherein the catalyst may be regenerated by passing an oxygen-containing gas through the catalyst, and then treating the catalyst with a hydrogen gas, while the entire regeneration process is carried out at a temperature from 300-800°C (col. 2, lines 22-46).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Grey, by first treating a used catalyst comprised of titanium, silicon, and a noble metal, such as palladium, with an oxygen gas and then a secondary treatment with hydrogen gas at a temperature of at least 250°C and 20°C respectively, because Schindler et al. continues to teach wherein a catalyst comprised of mixtures of titanium oxides, as well as silicon oxides along with a noble metal, such as palladium may be regenerated by passing an oxygen-containing gas through the catalyst, and then treating the catalyst with a hydrogen gas, while the entire regeneration process is carried out at a temperature from 300-800°C. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art would have expected a process for treating a catalyst comprised of a titanium zeolite with a noble metal, as taught by Schindler et al. to have been similarly useful and applicable to a process for using a catalyst comprised of a titanium zeolite and a supported catalyst comprising palladium as taught by Grey.

Grey continues to disclose wherein the catalyst is contacted with a solvent prior to regeneration (col. 3, line 59 – 61).

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Schindler et al. continues to teach wherein the catalyst may be comprised of a titanium silicate along with either both platinum and/or palladium (col. 4, lines 1-14), with respect to claims 8, 9, 17, and 18.

With respect to claims 10 and 15, it would have been obvious to heat the used catalyst at a temperature of at least 250°C, because Schindler teaches heating the catalyst at a temperature from 300-800°C, wherein the initial treatment is comprised of flushing with an inert gas, therefore the catalyst is heated in the absence of oxygen.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6310224; US Patent 6403815; USP 6441203; 6498259; USP 5798313; USP 5916835; USP 5965754.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N. Strickland whose telephone number is 571-272-1359. The examiner can normally be reached on M-TH, 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonas N. Strickland  
August 11, 2005



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